

AGU Fall 01 Abstract in B. Kamb Session

ICE BOREHOLE VIDEO OF BASAL DOMAIN OF ICE STREAM C IN THE 2000-2001 FIELD SEASON

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Since acquiring valuable data from interpretation of photographs taken at the glacier beds in the 1960's, it had been the desire of Prof. Kamb and coworkers to acquire video data of the basal environment of West Antarctic ice streams. In the period prior to the 2000-2001 field season while preparations were underway to revisit Ice Stream C, the ideal opportunity arose in the form of a collaboration between the Caltech Glaciology Program and a group of scientists and technologists at the Jet Propulsion Laboratory; these teams found a mutual interest in acquiring in-situ optical data in the deep glacial subsurface. The Caltech-JPL team designed and built the Ice Borehole Camera which was subsequently deployed in three hot-water drilled holes in Ice Stream C. The scientific objectives of the deployments were to develop an understanding of subglacial accretion of ice and debris with emphasis on differences between sticky spots and the (slowly) streaming ice, to directly observe ice-bed interactions including, if possible, the nature of water flow and ice-rock relative motion, and to visually examine other ice sheet properties in-situ. The deployments were successful, and good data were acquired on a number of phenomena. Results will be shown to illustrate surprising debris loads observed to greater depths above the bed than anticipated, an unexpected subglacial "lake" of about 1.4 m depth was entered on the shoulder of the sticky spot, and debris distribution in the ice suggesting variation in subglacial freezing rates consistent with current research in premelting of ice. The design of the Ice Borehole Camera will also be discussed.